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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/673,589	09/29/2003	Robert James Byram	DP-309304	2404

22851 7590 01/11/2005

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EXAMINER	
WHITTINGTON, KENNETH	

ART UNIT	PAPER NUMBER
2862	

DATE MAILED: 01/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/673,589	BYRAM, ROBERT JAMES	
	Examiner	Art Unit	
	Kenneth J Whittington	2862	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-27 is/are pending in the application.

4a) Of the above claim(s) 16-27 is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-15 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 29 September 2003 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions was required under 35 U.S.C. 121:

I. Claims 1-15, drawn to a rotary position sensor wherein the magnetic sensor is oriented between a pair of magnetic poles, classified in class 324, subclass 207.25.

II. Claims 16-27, drawn to a rotary position sensor wherein the magnetic sensor is oriented between a pair of pole pieces, classified in class 324, subclass 207.2.

The inventions are distinct, each from the other because of the following reasons:

The inventions in Group I and Group II contain distinct subject matter. Particularly the orientation of the magnets and pole pieces. In Group I, the magnetic poles material surrounds the magnetic sensor. In Group II, a pair of pole pieces have a portion adjacent to a magnet and another portion that defines an air gap wherein a magnetic sensor is placed. As suggested by Examiner and affirmed by Attorney for Applicant Jimmy Funke, Reg. No. 34166, these inventions are distinct.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

During a telephone conversation with Jimmy Funke on January 6, 2004 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-15. Affirmation of this election must be made by applicant in replying to this Office action. Claims 16-27 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 14 and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 15 recites a limitation that is impossible in some circumstances. For example, this claim recites that the axis of rotation is located between the

magnetic assembly and the magnetosensitive device along a centerline (which extends through the axis of rotation). However, if the magnetosensitive device is offset from the axis of rotation, then at some point in the rotation, the magnetosensitive device will be offset from the centerline and the axis of rotation will not be between the magnetic assembly and the magnetosensitive device along the centerline. This is shown in FIG. 7 of the application. Although the centerline I is not shown in FIG. 7, it would extend at a 45 degree angle from the upper left to the bottom right of the figure (using FIG. 1 as a reference to where centerline I is located).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamashita et al. (JP 03206914A). Regarding claim 1, Yamashita et al. discloses a rotary position sensor having an axis of rotation (See Yamashita et al. FIGS. 1 and 2, item 1A), comprising:

a magnetic assembly having first and second poles with an air gap therebetween (See FIGS. 1 and 2, items 3 and 4);

a magnetic sensor located within the air gap (See FIGS. 1 and 2, item 5);

wherein the axis of rotation is a first distance from a reference point of the magnetic sensor (See FIGS. 1 and 2, shown but not identified); and

wherein the air gap is a second distance (See FIGS. 1 and 2).

Regarding claim 2, Yamashita et al. discloses a reference direction of the magnetic sensor being oriented perpendicular a plane formed by the reference point and the rotation axis (See FIGS. 1 and 2, item 5).

Regarding claim 3, Yamashita et al. discloses the rotation axis located along a line between the first and second poles (See FIGS. 1 and 2).

Regarding claim 4, Yamashita et al. discloses the rotation axis located substantially midway between the poles (See FIGS. 1 and 2).

Claims 1-6, 14 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Hamaoka et al. (US 6,356,073).

Regarding claim 1, Hamaoka et al. discloses a rotary position sensor having an axis of rotation (See Hamaoka et al. FIGS. 8-10), comprising:

a magnetic assembly having first and second poles with an air gap therebetween (See FIGS. 9, items 39);

a magnetic sensor located within the air gap (See FIG. 9, either item 31);

wherein the axis of rotation is a first distance from a reference point of the magnetic sensor (See FIG. 9, shown but not identified); and

wherein the air gap is a second distance (See FIG. 9).

Regarding claim 2, Hamaoka et al. discloses a reference direction of the magnetic sensor being oriented perpendicular to a plane formed by the reference point and the rotation axis (See FIG. 9).

Regarding claim 3, Hamaoka et al. discloses the rotation axis located along a line between the first and second poles (See FIG. 9).

Regarding claim 4, Hamaoka et al. discloses the rotation axis located substantially midway between the poles (See FIG. 9).

Regarding claim 5, Hamaoka et al. discloses the magnetic assembly being either a magnet arc or a ring magnet (See FIGS. 9 and 10).

Regarding claim 6, Hamaoka et al. discloses the magnetic assembly further comprising a flux carrying ring affixed to the magnets (See FIGS. 9 and 10, item 24).

Regarding claim 14, as interpreted to be not indefinite (see rejection above), Hamaoka et al. discloses the rotation axis being between the magnetic assembly and the magnetic sensor along a centerline (See FIGS. 8-10).

Regarding claim 15, Hamaoka et al. discloses the reference direction being oriented substantially parallel to an imaginary line passing through the reference point and the axis of rotation (See FIG. 8).

Claims 1, 14 and 15 are rejected under 35 U.S.C. 102(e) as being anticipated by Mattson et al. (US 2004/0257067).

Regarding claim 1, Mattson et al. discloses a rotary position sensor having an axis of rotation (See Mattson et al. FIG. 1, item 11), comprising:

a magnetic assembly having first and second poles with an air gap therebetween (See FIG. 1, items 3);

a magnetic sensor located within the air gap (See FIG. 1, item 5);

wherein the axis of rotation is a first distance from a reference point of the magnetic sensor (See FIG. 1, item D); and

wherein the air gap is a second distance (See FIG. 1, item SP).

Regarding claim 14, as interpreted to be not indefinite (see rejection above), Mattson et al. discloses the rotation axis being between the magnetic assembly and the magnetic sensor along a centerline (See FIG. 1, note this occurs when the stator 1 is rotated 90 degrees clockwise from the position shown).

Regarding claim 15, Mattson et al. discloses the reference direction being oriented substantially parallel to an imaginary line passing through the reference point and the axis of rotation (See FIG. 1, note orientation of components).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 2-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mattson et al. in view of Hamaoka et al. Regarding claim 2, Mattson et al. discloses each and every feature of claim 1 as noted above. However, Mattson et al. does not explicitly disclose rotating the magnetic sensor so that the reference direction is perpendicular to the imaginary plane passing through the reference point of the sensor and the axis of rotation. Hamaoka et al. teaches orienting the magnetic

sensor so that its reference direction is perpendicular to the imaginary plane (See Hamaoka et al. FIG. 9). One having ordinary skill in the art would have been motivated to do so in view of the statements in Mattson et al. that various orientations of the components as disclosed in Mattson et al. are possible (See Mattson et al. page 5, paragraph 0057) and in view of Hamaoka et al. which discloses alternative orientations offsetting the Hall sensors such that the reference direction of the sensor is parallel or perpendicular to the imaginary plane without changing operation of the invention, one sensor merely being a backup to the other sensor (See Hamaoka et al. FIGS. 8 and 9 and col. 5, lines 16-33, note that each Hall IC 31 provides a voltage, the pair dual voltages are compared for abnormalities). Furthermore, one having ordinary skill in the art would know that rotating a Hall sensor 90 degrees provides equal performance of the Hall sensor and such rotation only changes the phase of the measurement (See Pointer, US 6,771,065).

Regarding claim 3, the combination of Mattson et al. and Hamaoka et al. discloses the rotation axis located along a line between the first and second poles (See Mattson et al. FIG. 1).

Regarding claim 4, the combination of Mattson et al. and Hamaoka et al. discloses the rotation axis located substantially midway between the poles (See Mattson et al. FIGS. 1 and 2).

Regarding claim 5, Mattson et al. in view of Hamaoka et al. teach each and every limitation of claims 1-3 as discussed above. However, this combination does not explicitly teach the magnet being a permanent arc or ring magnet. Hamaoka et al. further teaches using either an arc magnet (See Hamaoka et al. FIGS. 8-10). It would have been obvious to use the arc shaped magnets of Hamaoka et al. in lieu of the cylindrical magnets as taught by Mattson et al. One having ordinary skill in the art would have been motivated to do so in view of the statement in Mattson et al. that any magnet shape would work in conjunction with the apparatus therein (See Mattson et al. page 5, paragraph 0057).

Regarding claim 6, Mattson et al. in view of Hamaoka et al. teach each and every limitation of claims 1-3 and 5 as discussed above. However, this combination does not explicitly teach a flux carrying ring. Hamaoka et al. teaches of attaching a flux carrying ring outside the magnets in a rotary sensor (See Hamaoka et al. FIGS. 8-10, item 24). It would have been obvious to use the flux ring of Hamaoka et al. One having ordinary skill in the art would have been motivated to do so to complete

the magnetic flux circuit from throughout the rotary sensor (See Hamaoka et al. FIG. 3, col. 4, line 4 to col. 5, line 32). Furthermore, such flux guide rings are well know in the art for completing such magnetic circuits (See Schroeder et al., US 6,489,761, FIGS. 2A and 2B, item 118 and col. 4, lines 21-28).

Regarding claim 7, the combination of Mattson et al. and Hamaoka et al. teaches the magnet being made of Samarium Cobalt (See Mattson et al. page 3, paragraph 0041).

Regarding claim 8, the combination of Mattson et al. and Hamaoka et al. teaches the magnet being a bar or rectangular magnet (See Mattson et al. page 5, paragraph 0057).

Regarding claims 9-13, the combination of Mattson et al. and Hamaoka et al. teaches ratios of the distance from the rotation axis to the reference point of the magnetic sensor (first selected distance) to the distance between the magnets (second selected distance) (See Mattson et al. paragraph 0030); and further teaches of using various magnet spacings for the second selected distance (See Mattson et al. paragraphs 0030 and 0042-0050). Such ratios and spacings can be used to determine particular first selected distance. Accordingly, the combination of Mattson et al. and Hamaoka et al. teaches the distances and ratios outlined in claims 9-13.

Furthermore, where the general features of the claims are taught in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. *See In re Aller*, 105 USPQ 233, 235 (CCPA 1955).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ooki et al. (US 6724185), Makino et al. (US 2002/0186009), Hamaoka et al. (US 6,483,296) and Johnson et al. (US 2003/0132745) each teach various angle position sensors wherein the sensors are offset from the center of rotation and oriented either parallel or perpendicular to the imaginary plane. Nakamura et al. (US 6,501,265) teaches an angle position sensor wherein the sensor is offset between pole pieces. Okazaki et al. (US 2003/0080732), Reichel et al. (US 2003/0141863), Luetzow (US 6137288) and Ventoni et al. (US 6,417,664) each teach angle position sensors using a single sensor, offset from the rotation axis.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth J Whittington whose telephone number is (571) 272-2264. The

examiner can normally be reached on Monday-Friday, 7:30am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, N. Le can be reached on (571) 272-2233. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kenneth J Whittington
Examiner
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JAY PATIDAR
PRIMARY EXAMINER

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